

U.S. Patent Application No.: 10/532,084
Amendment filed November 2, 2007
Reply to OA dated August 2, 2007

AMENDMENTS TO THE CLAIMS

Claim 1 (currently amended): A conductive resin composition comprising:

a conductive filler (A);

a urethane-modified epoxy (meth)acrylate (B) obtained by reacting an epoxy (meth)acrylate (b-1) with a polyisocyanate (b-2); the epoxy (meth)acrylate (b-1) being obtained by an addition reaction of an epoxy resin having an aromatic cyclic structural unit and/or an aliphatic cyclic structural unit and a (meth)acrylic acid; the epoxy (meth)acrylate (b-1) having a hydroxyl value in the range of /00 to 300; the molar ratio of moles of hydroxyl group of the epoxy (meth)acrylate (b-1) to moles of isocyanate group of the polyisocyanate (b-2) being within the range of 1.0/(0.5 to 1.5);

a (meth)acrylate (C) having a number average molecular weight of 500 to 10,000, which contains 20 to 80% by weight of an aromatic cyclic structural unit and/or an aliphatic cyclic structural unit and contains no active hydrogen atom; the (meth)acrylate (C) is a reaction product obtained by reacting a polyetherpolyol having an aromatic cyclic structural unit and/or an aliphatic cyclic structural unit with a (meth)acrylic acid, or a reaction product obtained by reacting a polyisocyanate having an aromatic cyclic structural unit and/or an aliphatic cyclic structural unit with a polyetherpolyol having an aromatic cyclic structural unit and/or an aliphatic cyclic structural unit under the conditions that an isocyanate group of the polyisocyanate is in excess of a hydroxyl group of the polyol, with a (meth)acrylate having a hydroxyl group; and

the other ethylenically unsaturated monomer (D) which is copolymerizable with the urethane-modified epoxy (meth)acrylate (B) and the (meth)acrylate (C).

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Claim 2 (Original): A conductive resin composition according to claim 1, wherein the epoxy resin contains 30 to 90% by weight of an aromatic cyclic structural unit and/or an aliphatic cyclic structural unit.

Claim 3 (Original): A conductive resin composition according to claim 1, wherein the epoxy resin is a novolac type epoxy resin.

Claim 4: Canceled

Claim 5 (Original): A conductive resin composition according to claim 4, wherein the polyetherpolyol having an aromatic cyclic structural unit and/or an aliphatic cyclic structural unit is an alkylene oxide adduct of a multinucleate phenolic compound.

Claims 6-7: Canceled

Claim 8 (Original): A conductive resin composition according to claim 1, wherein a weight ratio of the urethane-modified epoxy (meth)acrylate (B) to the (meth)acrylate (C) is from 95/5 to 50/50.

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Claim 9 (Original): A conductive resin composition according to claim 1, wherein the content of the conductive filler (A) is from 50 to 90% by weight.

Claim 10 (Previously Presented): A conductive resin composition according to claim 1, wherein the content of the conductive filler (A) is from 50 to 90% by weight, the content of the urethane-modified epoxy (meth)acrylate (B) is from 6 to 18% by weight, the content of the (meth) acrylate (C) is from 2 to 8% by weight, the content of the other ethylenically unsaturated monomer (D) is from 2 to 25% by weight, and the total percentage of (A), (B), (C), and (D) is 100%.

Claim 11 (Original): A conductive resin composition according to claim 1, wherein the ethylenically unsaturated monomer (D) is an aromatic vinyl monomer.

Claim 12 (Previously Presented): A method for producing a conductive resin composition, which comprises:

(1) the first step of kneading a conductive filler (A), an epoxy (meth)acrylate (b-1) obtained by the addition reaction of an epoxy resin having an aromatic cyclic structural unit and/or an aliphatic cyclic structural unit and a (meth)acrylic acid, a polyisocyanate (b-2), a (meth)acrylate (C) having a number average molecular weight of 500 to 10,000, which contains 20 to 80% by weight of an aromatic cyclic structural unit and/or an aliphatic cyclic structural unit and contains no active hydrogen atom, and an ethylenically unsaturated monomer (D); and

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(2) the second step of reacting the kneaded mixture obtained in the first step with the (meth)acrylate (b-1) and the polyisocyanate (b-2) at a temperature of room temperature to 80°C, thereby causing chain elongation;

wherein the epoxy (meth)acrylate (b-1) has a hydroxyl value in the range of 100 to 300; and, the molar ratio of moles of hydroxyl group of the epoxy(meth)acrylate (b-1) to moles of isocyanate group of the polyisocyanate (b-2) is within the range of 1.0/(0.5 to 1.5).

Claim 13 (Previously Presented): A separator for a fuel cell obtained by molding the conductive resin composition according to claim 1.

Claim 14 (Previously Presented): A separator for a fuel cell obtained by molding the conductive resin composition according to claim 2.

Claim 15 (Previously Presented): A separator for a fuel cell obtained by molding the conductive resin composition according to claim 3.

Claim 16 (Previously Presented): A separator for a fuel cell obtained by molding the conductive resin composition according to claim 4.

Claim 17 (Previously Presented): A separator for a fuel cell obtained by molding the conductive resin composition according to claim 5.

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Claim 18 (Previously Presented): A separator for a fuel cell obtained by molding the conductive resin composition according to claim 6.

Claim 19 (Currently Amended): A separator for a fuel cell obtained by molding the conductive resin composition according to claim 10 ~~claim 7~~.

Claim 20 (Previously Presented): A separator for a fuel cell obtained by molding the conductive resin composition according to claim 8.